

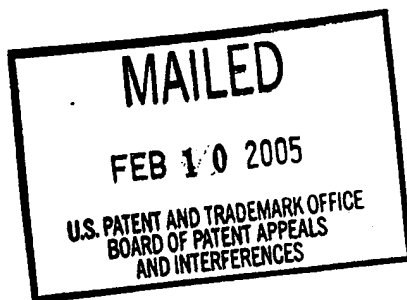
The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 43

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KENNETH W. MARR



Appeal No. 2005-0026
Application No. 09/277,893

ON BRIEF

Before GARRIS, OWENS, and WALTZ, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 17 through 33, 50 through 72, and 74 through 101, which are all of the claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellant, the invention is directed to a method of fabricating a fuse where a layer of conductive material is deposited adjacent an insulative structure, the conductive material is patterned to define at least two discrete spaced

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apart regions with the underlying insulative structure exposed between these spaced apart regions, and a layer of a metal silicide or polycide is formed over the conductive material and the exposed region (Brief, page 5). This layer of silicide or polycide is then patterned to define the upper layer of the terminals and the more narrow central region of the fuse (*id.*).¹

Appellant states that the claims on appeal should be grouped into three groups (Brief, page 8). To the extent appellant presents specific, substantive arguments for the separate patentability of an individual claim or group of claims, we consider these claims separately. See 37 CFR § 1.192(c)(7)(2002); *In re McDaniel*, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002). Representative independent claim 17 is reproduced below:

17. A method of fabricating a fuse upon a semiconductor device, comprising:
disposing a layer of conductive material over an insulative structure of the semiconductor device;
patterning said layer of conductive material to define at least two laterally discrete, spaced apart

regions of conductive material between and around which said insulative structure is exposed;

¹The fuse per se has been claimed in a divisional application (S.N. 09/702,583) (Brief, page 2). This application was the subject of Appeal No. 2004-0033, with a decision mailed Jan. 2, 2004 (Paper No. 20), affirming all rejections on appeal.

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disposing a layer of metal silicide over the semiconductor device, including adjacent to said at least two regions and to said insulative structure exposed between and around said at least two regions; and
patterning said layer of metal silicide so as to define at least two terminal regions of the fuse, each of which is in contact with a corresponding one of said at least two regions of conductive material, and a central region disposed between said at least two terminal regions and in contact with said insulative structure.

The examiner has relied on the following references as evidence of obviousness:

Fischer et al. (Fischer)	5,185,291	Feb. 09, 1993
Sandhu	5,231,056	Jul. 27, 1993
Degelormo et al. (Degelormo)	5,242,859	Sep. 07, 1993
Chen	5,712,206	Jan. 27, 1998
Ukeda et al. (Ukeda)	6,069,055	May 30, 2000
Mitani (published Japanese Kokai Patent Application) ²	58-27569	Sep. 03, 1984

The following rejections are before this merits panel for review in this appeal:

(1) claims 17-33, 50-72 and 74-101 stand rejected under 35 U.S.C. § 112, ¶1, as containing subject matter which was not described in the original specification in such a way as to reasonably convey to one skilled in the art that the appellant had possession of the invention as now claimed at the time of filing (Answer, page 4);

²We rely upon and cite from a full English translation of this document, previously made of record.

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(2) claims 17, 19-24 and 26-33 stand rejected under 35 U.S.C. § 103(a) over Fischer in view of Chen (Answer, page 5);

(3) claim 18 stands rejected under § 103(a) over Fischer in view of Chen and Mitani (Answer, page 8);

(4) claim 25 stands rejected under § 103(a) over Fischer in view of Chen and Sandhu (*id.*);

(5) claims 50, 51, 55-60 and 62-68 stand rejected under § 103(a) over Fischer in view of Chen and Mitani (Answer, page 9);

(6) claims 52-54, 69 and 70 stand rejected under § 103(a) over Fischer in view of Mitani, Chen and Degelormo (Answer, page 12);

(7) claim 61 stands rejected under § 103(a) over Fischer in view of Mitani and Chen and Sandhu (Answer, page 13);

(8) claims 71, 74-86, 88-96 and 101 stand rejected under § 103(a) over Mitani in view of Fischer and Chen (*id.*);

(9) claim 72 stands rejected under § 103(a) over Mitani in view of Fischer, Chen and Degelormo (Answer, page 17);

(10) claim 87 stands rejected under § 103(a) over Mitani in view of Fischer, Chen and Sandhu (*id.*);

(11) claims 97-100 stand rejected under § 103(a) over Mitani in view of Fischer, Chen and Ukeda (Answer, page 18).

Based on the totality of the record, we *affirm* the examiner's rejection based on section 112, first paragraph, essentially for the reasons stated in the Answer and as set forth below. We reverse all of the rejections on appeal based on section 103(a) essentially for the reasons stated in the Brief, Reply Brief and those reasons set forth below. Accordingly, the

decision of the examiner to reject the claims on appeal is affirmed.

OPINION

A. *The Rejection under § 112, ¶1*

The examiner concisely and correctly states the issue as "whether or not there is support in the originally filed specification for [the claimed] 'laterally discrete spaced apart regions of said first layer of conductive material *around and between which* an underlying insulative structure is exposed' [emphasis added]." Answer, page 19. The examiner finds that there is no support in the specification that the insulative structure is exposed around and between the regions, nor has appellant pointed to any support for this claimed limitation (*id.*). More specifically, the examiner finds that Figure 4 only depicts layer 14 spaced apart from itself and appellant has not pointed to any original disclosure or suggestion that any portion of the insulating layer is exposed around spaced apart regions of the patterned conductive layer 14 (Answer, page 20).

Appellant argues that the spaced apart regions 14a and 14b are shown in the original drawings as being "laterally discrete"

from each other (Brief, page 11, citing Figures 6-8). Appellant further argues that the specification clearly provides that the polysilicon is disposed as discrete regions or portions that are substantially isolated from each other (Brief, page 11; Reply Brief, page 3, citing the specification at page 4, l. 27-page 5, l. 1).

An *ipsis verbis* disclosure is not necessary to satisfy the written description requirement of section 112, first paragraph. The disclosure need only reasonably convey to one of ordinary skill in the art that the inventor had possession of the subject matter in question at the time of filing. See *In re Edwards*, 568 F.2d 1349, 1351-52, 196 USPQ 465, 467 (CCPA 1978). The original drawings may provide "written description" of the claimed subject matter as required by section 112. See *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1565, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); *Ex parte Holt*, 19 USPQ2d 1211, 1213 (Bd. Pat. App. & Int. 1991).

Appellants argue that the original specification teaches that "the polysilicon that underlies the terminal regions of the fuse is disposed on the insulative structure in discrete regions or portions that are substantially isolated from one another" (page 4, l. 27-page 5, l. 1, underlining added) (Brief, page 11;

Reply Brief, page 3)³. As also taught in the original specification, "the underlying insulative structure is exposed between the at least two spaced apart regions of the layer of conductive material" (page 5, ll. 12-14, underlining added; see also page 7, ll. 12-15).

As correctly found by the examiner, appellant's Figure 4 depicts patterning of the first conductive layer (polysilicon) while Figure 6 relates to a further step of patterning the metal silicide to form the fuse and gate structures (Answer, page 20; see the specification, page 9, l. 16-page 10, l. 14 and page 11, l. 7-page 12, l. 3). The examiner correctly argues that Figure 4 shows layer 14 as a continuous layer, with no insulative structure around it (Answer, pages 20-21). The examiner is also correct that appellant has not labeled the "laterally discrete spaced apart regions" as 14a and 14b in Figure 4, as appellant did for Figures 7 and 8 (Answer, page 20).

We determine that the examiner has established that Figure 4, and its corresponding disclosure in the specification, depicts

³We also note that appellant presents arguments concerning the objections to the drawings and the specification (Brief, pages 9-11). As correctly noted by the examiner (Answer, page 3, ¶(6)), these issues are petitionable, not appealable. See *MPEP*, § 1002.02(c) and § 1201, 8th ed., Rev. 2, May 2004.

patterning a layer of conductive material to define at least two lateral spaced apart regions *between* which the insulative structure is exposed. Accordingly, the examiner has met the initial burden of establishing why persons skilled in the art would not recognize in the disclosure a description of the invention as now claimed. See *In re Alton*, 76 F.3d 1168, 1175, 37 USPQ2d 1578, 1583 (Fed. Cir. 1996). Therefore the burden of coming forth with evidence or arguments shifts to appellant. See *In re Alton*, *supra*. As correctly noted by the examiner (Answer, page 20), appellant's argument that Figures 6-8 describe the spaced apart regions 14a and 14b is not well taken (Brief, page 11). Figures 6-8 are directed to patterning of the metal silicide and forming the fuse and gate structures (see the specification, page 11, l. 7-page 13, l. 10). The language in question relates to "patterning said layer of conductive material" that is over an insulative structure to form the spaced apart regions between which the insulative structure is exposed (see claim 17 on appeal). As correctly found by the examiner (Answer, page 20), this patterning step is depicted by Figure 4, which fails to show that the lateral spaced apart regions are "discrete" or that the insulative structure is exposed "around"

the regions (see also the specification, page 9, l. 16-page 10, l. 14).

Appellant also argues that the examiner inappropriately limits the relevant description to the Figures and does not consider the "as-filed specification" as a whole (Reply Brief, page 2). This argument is also not well taken. As discussed above, the accompanying disclosure in the specification has been considered along with the depictions of the invention in the Figures. Contrary to the argument in the Reply Brief mentioned above, appellant admits that the accompanying disclosure "does not itself explain that these regions are laterally discrete from one another" (Brief, page 11). Furthermore, as discussed above, the original disclosure does not explain that the insulative structure is exposed between *and* around these regions during the patterning step (the only description refers to exposure of the insulative structure "between" these regions during the patterning step; see the specification, page 5, ll. 12-14).

Appellant argues that the disclosure that the regions are discrete and "substantially isolated" from one another would provide basis or support for the subject matter in question (Reply Brief, page 3). Appellant also argues that it would be "inherent" that when the first layer of conductive material is

patterned to form laterally discrete spaced apart regions, the underlying insulative structure would be exposed around and between these regions (Reply Brief, page 4). These arguments are not persuasive. Appellant has not established that the disclosed term "substantially isolated" refers to the regions as they are first patterned rather than the final structure or steps as shown in Figures 6-8. Additionally, this term "substantially isolated" has not been defined in the specification as meaning that the insulative structure is exposed "between and around" these regions. Appellant's argument that the exposure of the insulative structure around and between the regions would be "inherent" is not persuasive since it has not been established that the lateral spaced apart regions of Figure 4 are "discrete."

For the foregoing reasons and those stated in the Answer, we determine that the examiner has met the initial burden of establishing a failure to fulfill the "written description" requirement of section 112, first paragraph. Based on the totality of the record, including due consideration of appellant's arguments, we determine that the originally filed specification and figures do not convey with reasonable clarity to those of ordinary skill in the art at the time of filing that appellant was in possession of the invention as now claimed.

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Therefore we affirm the examiner's rejection of all the claims on appeal under 35 U.S.C. § 112, first paragraph, for failure to fulfill the "written description" requirement.

B. The Rejections under § 103(a)

With regard to the rejection of claim 17, the examiner finds that Fischer discloses disposing a layer of conductive material over an insulative structure of a semiconductor device, patterning the layer of conductive material to define at least two spaced apart regions of conductive material through which the insulative structure is exposed, disposing a second conductive layer over the patterned layers, and patterning the second conductive layer so as to define at least two terminal regions of the fuse and a central region disposed between the terminal regions (Answer, pages 5-6). The examiner recognizes that Fischer discloses that the second conductive layer may be a metal such as aluminum or tungsten, or may be polysilicon (Answer, page 23, citing col. 2, ll. 43-45 and 59-63). The examiner applies Chen as evidence that alternate materials may be used as the fuse, specifically teaching the use of polysilicon, aluminum, metal silicides, and polycides, with a preference for tungsten silicide (Answer, pages 6 and 23, citing Chen col. 5, ll. 59-63). From these findings, the examiner concludes that it would have

been obvious to one of ordinary skill in this art at the time of appellant's invention to use the metal silicide fuse material taught by Chen for the fuse material in the method of forming a fuse as disclosed by Fischer (Answer, pages 6 and 23-24).

Appellant argues that the patterning of the first conductive layer of Fischer does not result in the formation of "laterally discrete spaced apart regions" such as appellant's regions 14a and 14b (Brief, page 14).

Appellant also argues that both Fischer and Chen lack any teaching or suggestion of patterning a conductive layer to define at least two "laterally distinct, spaced apart regions between and around which an underlying insulative structure is exposed" (Brief, sentence bridging pages 17-18). We agree.

The examiner finds that the insulative structure of Fischer is exposed "*between the at least two regions*" (Answer, page 5, italics added). The examiner has not cited any reference which discloses or suggests patterning a conductive layer to define at least two "laterally discrete, spaced apart regions between and around which an underlying insulative structure is exposed" (see the Answer in its entirety). Rather, the examiner has stated:

It has been shown that at least "around and between which an underlying insulative structure is exposed" is not supported in the originally filed specification. Clearly this aspect of the limitation can not be understood as it relates to the presently claimed invention. Therefore, this aspect of the limitation has not been addressed in the rejection. [Answer, page 27].

This position by the examiner ignores a limitation of the claims.⁴ In determining the patentability of a claim against the prior art, all of its limitations, whether supported by the original disclosure or not, must be considered. See *Ex parte Grasselli*, 231 USPQ 393, 394 (Bd. App. 1983); cf., *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

For the foregoing reason, we determine that the examiner has not established a *prima facie* case of obviousness. Thus we cannot sustain the rejection over Fischer in view of Chen. We also cannot sustain the rejections involving the secondary references to Mitani, Sandhu, Degelormo, and Ukeda since these references do not remedy the deficiency noted above with regard to Fischer and Chen. Similarly, the rejections employing Mitani as a primary reference do not consider the limitation of the

⁴Every independent claim on appeal contains the disputed language discussed in the section 112 rejection above.

independent claims as discussed above. Therefore we reverse all of the rejections on appeal based on 35 U.S.C. § 103(a).

C. Summary

The rejection of claims 17-33, 50-72 and 74-101 under 35 U.S.C. § 112, ¶1, is affirmed.

The following rejections under 35 U.S.C. § 103(a) have been reversed:

- (1) claims 17, 19-24 and 26-33 over Fischer in view of Chen;
- (2) claim 18 over Fischer in view of Chen and Mitani;
- (3) claim 25 over Fischer in view of Chen and Sandhu;
- (4) claims 50, 51, 55-60 and 62-68 over Fischer in view of Chen and Mitani;
- (5) claims 52-54, 69 and 70 over Fischer in view of Mitani, Chen and Degelormo;
- (6) claim 61 over Fischer in view of Mitani, Chen and Sandhu;
- (7) claims 71, 74-86, 88-96 and 101 over Mitani in view of Fischer and Chen;
- (8) claim 72 over Mitani in view of Fischer, Chen and Degelormo;
- (9) claim 87 over Mitani in view of Fischer, Chen and Sandhu; and

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(10) claims 97-100 over Mitani in view of Fischer, Chen and Ukeda.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED

BRADLEY R. GARRIS
Administrative Patent Judge

Terry J. Owens
TERRY J. OWENS
Administrative Patent Judge

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THOMAS A. WALTZ
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